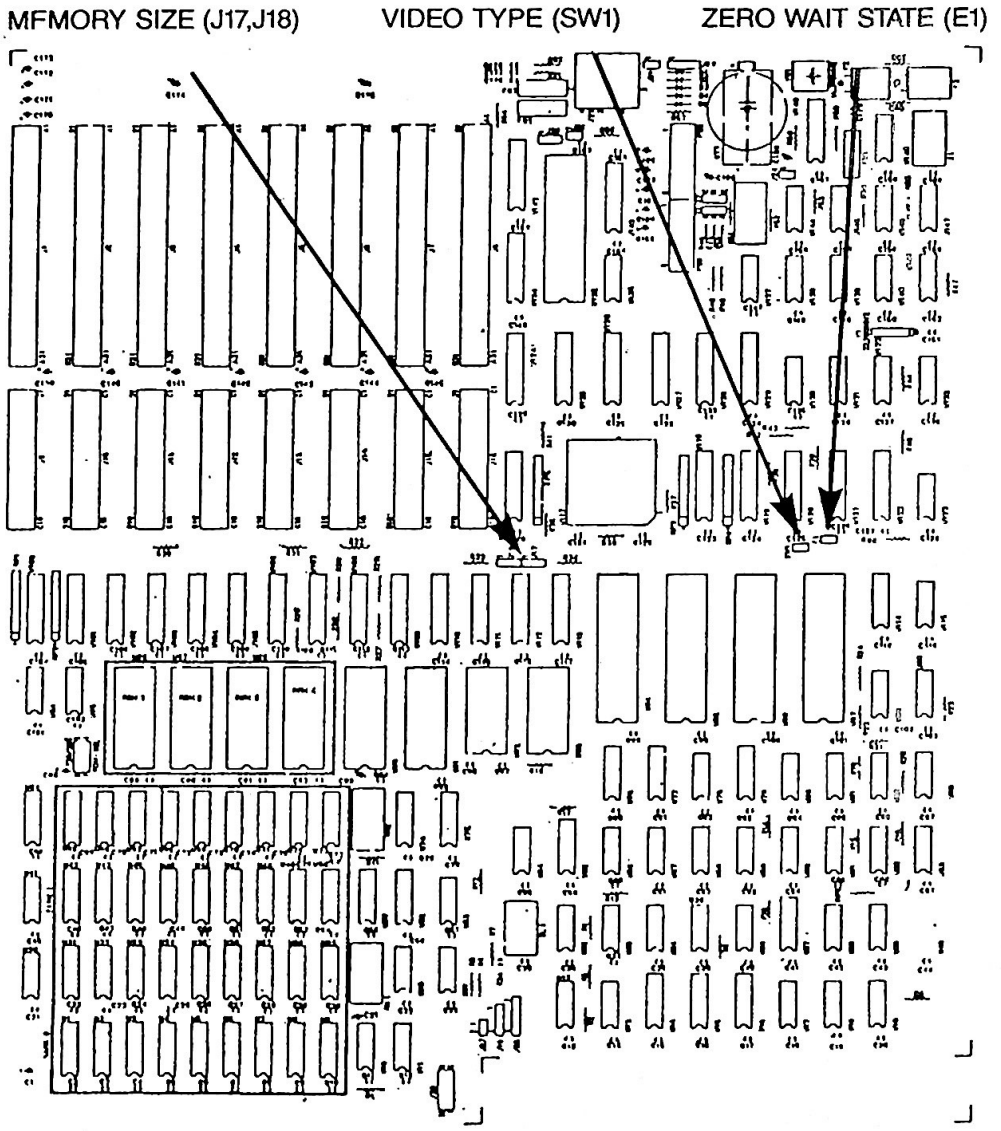
TURBO 286

Installation and Operations

FIGURE 3-4
SYSTEM BOARD



J19 - SPEAKER JUMPER
J20 - KEYLOCK
J22 - BATTERY CONNECTOR
J24 - HARDWARE RESET
J25 - SPEED SELECT SWITCH
J27 - TURBO LIGHT
J29 - 80287 SPEED SELECT
SW1 - DISPLAY ADAPTOR SELECT
J31 - RECHARGEABLE BATTERY SELECT

Changing the Amount of RAM on the System Board

The system comes with 512KB of RAM. You can install 512KB, 640KB, or 1,024KB on the system board of your system. No other amounts of RAM are possible on the system board.

Since DOS can use a maximum of 640KB of memory, when you install 1,024KB of memory on the system board, part of this memory is treated as expansion memory. (Expansion memory can be set up as an electronic disk by the DOS VDISK program or other RAM disk software.) When your system has 1,024KB of memory, either 512KB is base memory and 512KB is expansion memory or 640KB is base memory and 384KB is expansion memory.

To change the amount of memory, first add the correct number and type of RAM chips, then reset the jumpers on the J17 and J18 memory jumper pins for your configuration. Table 3-1 shows the possible configurations for your system.

Table 3-1
Memory Configurations:

Amount of Memory (KB)	Jumper Settings J17	J18	RAM Chips Bank 0	Bank 1
512	2-3	2-3	18-256K	none
640	2-3	1-2	18-256K	18-64K
640/384	1-2	1-2	18-256K	18-256K
512/512	1-2	2-3	18-256K	18-256K

RAM JUMPER AND MEMORY MAP

*J17; J18,--RAM JUMPER

THESE 2 JUMPERS IS FOR RAM SETTING ON CPU BOARD. PLS NOTE OUR BOARD CAN HAVE 512K, 640K OR 1M RAM ON BOARD:

(a) 512K RAM ON BOARD

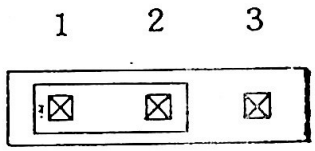
(b) 640K RAM ON BOARD

(d) 1M RAM ON BOARD (512K RAM INTERNAL, 512K RAM FOR EXPANSION AREA)

(c) 1M RAM ON BOARD (640K RAM INTERNAL, 384K RAM FOR EXPANSION AREA)

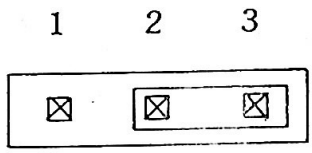
MATH processor 80287, Selector (J29)

(γ) J29



Jumper is ON at 1,2 then 80287 use 10 MHZ or higher speed type.

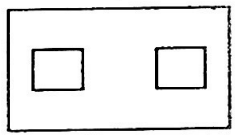
(β) J29



Jumper is ON at 2,3 then 80287 use 6 MHZ or higher speed type.

ZERO WAIT STATE
(E1)

E1



If jumper is installed on E1, then the board is running with 0 wait states.
If jumper is not installed, then the board is running at 1 wait state.

NOTE: For zero wait state:
- 120ns RAM for 10 MHz.
- 100ns RAM for 12 MHz.

Selecting the Type of Video Display

1. Install the new video adapter board in the system unit. (See **Installing an Adapter Board** in this chapter.)

2. Locate the jumper pins labeled SW1 on the system board (see Figure 3-4). If you have a monochrome (TTL) video display, place the jumper on only one pin. If you have a color, EGA, CGA (RGB) or black and white (composite) video display, place the jumper on both pins.

3. Connect the video display data cable to the video adapter at the rear of the system unit. (See Chapter 2.) Connect the video display power cord to the power supply connector at the rear of the computer or to the grounded wall outlet.

   NOTE: If you are using both types of video adaptors on the same system, set bit 2 on SW1 to the type you will use as the power-up display.

REPLACING THE SYSTEM UNIT COVER

1. Move the system unit so that its front is facing you. Hold the system unit cover so it is facing you, and tilt the front of the cover up. Place the metal tabs at the top rear of the cover behind the front panel of the system unit. (Refer to Figure 3-2.)

2. Lower the cover until it is horizontal with the system unit, and slide it into position.

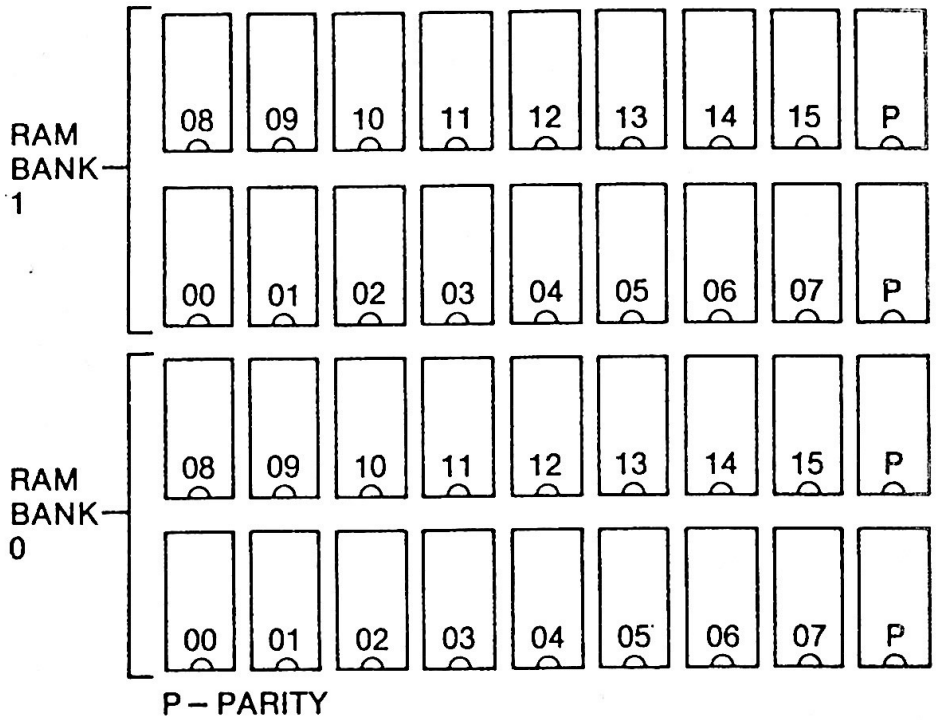
3. Replace the five screws. (See Figure 3-1.)

4. Replace all of the cables. (Refer to Chapter 2 of this manual if necessary.)

CAUTION

Make sure that each chip is installed with the notched edge or printed dot toward the front of the computer.

FIGURE A-2
MEMORY BANK CHART



2. If this does not correct the problem, use a small screwdriver to lift each chip out of its socket. Reinstall each chip. If the error recurs, one of the RAM chips in bank 0 is probably defective.

If the system beeps continuously when you turn it on, check the keyboard for stuck keys. If no keys are stuck, one or more of the RAM chips may be defective.

APPENDIX C
TECHNICAL DESCRIPTION

CONTENTS:

System Board Locations and Functions C-2
~~CPU and Support . . . . . C-3~~
Memory MapS C-4
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Clock-Calendar Battery - J22 . . . . . C-6
Battery Type - J31 . . . . . C-6
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Processing Speeds - J25 . . . . . C-7
ROM tYPE - ROM SEL C-7
Keylock/Indicator Light Console - J20 . . . . . C-7
Speaker - J19 . . . . . C-8

SYSTEM BOARD LOCATIONS AND FUNCTIONS

The following table describes the locations shown in Figure C-1.

Location	*Function*
J17,J18	Select the system board RAM configuration.
J19	Connector for the system speaker.
J20	Connector for the keylock and power LED.
J21	External keyboard connector (5-pin DIN).
J22	Connector for the external battery pack.
J24	Connector for the reset button.
J25	Selects the processor speed..
J27	Connector for the turbo LED.
J29	Selects the speed on the coprocessor.
J31	Selects the type of battery installed.
ROM SEL	Selects the type of ROM chips on the system.
SW1	Selects the type of display used as the primary display.

MEMORY MAPS

Your 80286 microprocessor can use two addressing modes. In 8088-compatible real-addressing mode, it can command 1MB of address space. In protected virtual-addressing mode, it can command 16MB of address space.

640/384 Memory Map

Address Space	Function
000000 - 07FFFF	512KB RAM on system board
080000 - 09FFFF	128KB RAM on system board
0A0000 - 0BFFFF	128KB Video memory
0C0000 - 0DFFFF	128KB I/O expansion ROM
0E0000 - 0EFFFF	64KB System ROM expansion
0F0000 - 0FFFFF	64KB Reserved for BIOS
100000 - 15FFFF	384KB Expansion memory
160000 - FDFFFF	14.85MB I/O Expansion memory
FE0000 - FEFFFF	64KB System ROM expansion
FF0000 - FFFFFF	64KB Reserved for BIOS

512/512 Memory Map

Address Space	Function
000000 - 07FFFF	512KB RAM on system board
080000 - 09FFFF	128KB I/O expansion RAM
0A0000 - 0BFFFF	128KB Video memory
0C0000 - 0DFFFF	128KB I/O expansion ROM
0E0000 - 0EFFFF	64KB System ROM expansion
0F0000 - 0FFFFF	64KB Reserved for BIOS
100000 - 17FFFF	512KB Expansion memory
180000 - FDFFFF	15MB I/O Expansion memory
FE0000 - FEFFFF	64KB System ROM expansion
FF0000 - FFFFFF	64KB Reserved for BIOS

VIDEO DISPLAY TYPE - SW1

For a monochrome (TTL) display, set bit 2 on SW1 to OFF. For a color, EGA, CGA (RGB) or black and white (composite) display, set bit 2 on SW1 to ON.

RAM CONFIGURATION - J17,J18

The system comes with 512KB of RAM installed on the system board. The system supports 512KB, 640KB, and 1,024KB (1MB) of RAM. No other RAM amounts are supported. To change the amount of RAM on the system board, install the appropriate RAM chips, as shown in Table C-1.

Table C-1
Memory Configurations:

Amount of Memory (KB)	Jumper Settings J17	J18	RAM Chips Bank 0	Bank 1
512	2-3	2-3	18-256K	none
640	2-3	1-2	18-256K	18-64K
640/384	1-2	1-2	18-256K	18-256K
512/512	1-2	2-3	18-256K	18-256K

DOS can use a maximum of 640KB of memory. When you install 1,024KB of memory on the system board, part of this memory must be treated as extended RAM. (Extended RAM can used as an electronic disk by most RAM disk programs.) When your system has 1,024KB of memory, either 512KB is base memory and 512KB is expansion memory or 640KB is base memory and 384KB is expansion memory.

Set jumpers J17 and J18 to indicate your preferred configuration, as shown in Table C-1.

CLOCK-CALENDAR BATTERY - J22

This connector is used to connect a battery pack that contains four size AA 1.5-volt batteries to the system board. To connect the battery pack to, connect the red wire on the battery pack to the positive pin (labeled +) on the board. You can install one 6-volt or two 3-volt lithium batteries in the battery socket (no wiring is required), but the standard AA batteries provide longer life.

BATTERY TYPE - J31

If you use rechargeable batteries, place a jumper across these pins.

RESET BUTTON - J24

The reset button connects to the main board at location J24.

PROCESSING SPEEDS - J25

The toggle switch for selecting processor speeds connects to the main board at location J25. To permanently select the 12MHz speed, place a jumper plug on J25.

ROM TYPE - ROM SEL

Two types of ROMs can be used on your system. Each type takes two of the ROM sockets on the system board. Socket U59 is the low order (0) socket and U61 is the high order (1) socket. The following table shows how the ROM SEL pins must be jumpered to select the type of ROM chips installed.

Type	KB/Chip	ROM SEL Jumpers
27256	32KB	5-6,7-8
27128	16KB	1-2,3-4

KEYLOCK/INDICATOR LIGHT CONSOLE - J20

The keylock and power indicator lamps connect to the system board at location J20. This connector is keyed so that you can only connect it the correct way. The wires on the fixed disk drive access indicator lamp connect to the diskette drive/fixed disk controller.

SPEAKER - J19

The system speaker is mounted within the system unit and connects to the main board at location J19.

FIXED DISK DRIVE TYPES

The following table lists many of the fixed disk drives available for your computer, their capacities, and their disk types. Enter the indicated disk type when you run SETUP. This list is reproduced from the list that is available when you run SETUP.

Fixed Disk Drive Type Specifications

TYPE	CYLIN-DERS	HEADS	PRE-COMP	LAND ZONE	SEC-TORS	SIZE MEGS*
1	306	4	128	305	17	10.1
2	615	4	300	615	17	20.4
3	615	6	300	615	17	30.6
4	940	8	512	940	17	62.4
5	940	6	512	940	17	46.8
6	615	4	no	615	17	20.4
7	462	8	256	511	17	30.6
8	733	5	no	733	17	36.4
9	900	15	no	901	17	112.0
10	820	3	no	820	17	20.4
11	855	5	no	855	17	35.4
12	855	7	no	855	17	49.6
13	306	8	128	319	17	20.3
14	733	7	no	733	17	42.5
16	612	4	0	633	17	20.3
17	977	5	300	977	17	40.5
18	977	7	no	977	17	56.7
19	1024	7	512	1023	17	59.5
20	733	5	300	732	17	30.4
21	733	7	300	933	17	42.5
22	733	5	300	733	17	30.4
23	306	4	0	336	17	10.1

* All sizes are approximate.

TYPE	CYLIN-DERS	HEADS	PRE-COMP	LAND ZONE	SEC-TORS	SIZE MEGS*
25	615	4	0	615	17	20.4
26	1024	4	-1	1023	17	34.0
27	1024	5	-1	1023	17	34.0
28	1024	8	-1	1023	17	42.5
29	512	8	256	512	17	34.0
30	615	2	615	615	17	20.4
31	989	5	0	989	17	41.0
35	1024	9	1024	1024	17	76.5
36	1024	5	512	1024	17	42.5
37	830	10	no	830	17	68.8
38	823	10	256	824	17	68.3
39	615	4	128	664	17	20.4
40	615	8	128	664	17	40.8
41	917	15	no	918	17	114.1
42	1023	15	no	1024	17	127.3
43	823	10	512	823	17	68.3
44	820	6	-1	820	17	40.8
45	1024	8	-1	1024	17	68.0
46	925	9	-1	925	17	69.1
47	699	7	256	700	17	40.6

* All sizes are approximate.

Examples of Fixed Disk Drive Types

Disk Type	*Drive Capacity*	*Examples of Drive Type*
1	10MB	Cogito CGF912; MMI M212 and M312; Seagate ST412, ST212, ST112; Rodime RO202; Tandon TM252 and TM502; Fujitsu M2233; Shugart 712[1]; MiniScribe 2012 and 3412
2	21MB	Tulin TL226[1]; CMI 6426; Qume R200[1]; Shugart 724[1]; Seagate 225
3	31MB	Tulin TL240[1]; CMI 6640 Qume R300[1]; Rodime RO206
4	64MB	Atasi 3080[1]
5	48MB	--
6	21MB	Seagate ST4026; Microscience 725; Tandon 262
7	31MB	Quantum Q540[1]
8	31MB	Seagate ST4038
9	115MB	Maxtor XT-1140[1]
10	21MB	Micropolis 1302[1]; Vertex V130[1,2]

1 Not all of the cylinders are used.

Disk Type	*Drive Capacity*	*Examples of Drive Type*
11	36MB	Vertex V150[1,2]; Seagate 4051 MiniScribe 6053
12	51MB	Vertex V170[1,2]
13	21MB	Seagate ST425; MMI M225 and M312; Rodime RO204; Fujitsu M2235
14	44MB	--

2 The Vertex drives actually have 987 cylinders, so only 83 percent of the V130 and 87 percent of the V150 and V170 are used.